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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

PATTERSON, MARC A

ART UNIT	PAPER NUMBER
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1772

DATE MAILED: 05/06/2002

5

Please find below and/or attached an Office communication concerning this application or proceeding.

AS-5

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/540,028	REIF ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Marc A Patterson	1772	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 February 2002.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 20-65 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 20-65 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All   b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                             | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |

**DETAILED ACTION**  
**WITHDRAWN REJECTIONS**

1. The 35 U.S.C. 112, second paragraph rejections of Claims 1, 24, 26, 32, 39 and 42, and the 35 U.S.C. 102(b) rejection of Claims 20, 29, 34 – 35 and 52 – 57 as being anticipated by Reese Jr. (U.S. Patent No. 5,667,866), and the 35 U.S.C. 103(a) rejection of Claims 22 – 28, 30 – 33, 36 – 48 and 60 as being unpatentable over Reese Jr. (U.S. Patent No. 5,667,866), and the 35 U.S.C 103(a) rejection of Claims 49 – 51 as being unpatentable over Reese Jr. (U.S. Patent No. 5,667,866) in view of Komai et al. (U.S. Patent No. 6,238,783), and the 35 U.S.C. 103(a) rejection of Claims 58 – 59 as being unpatentable over Reese Jr. (U.S. Patent No. 5,667,866) in view of Clark (U.S. Patent No. 6,004,652), of record on page 2 of the previous Action, are withdrawn.

**NEW REJECTIONS**

***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claim 20 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The phrase ‘equalization of at least one of the elastic modulus determining stiffness and a coefficient of thermal expansion’ does not appear in the specification.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 20 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With regard to Claim 20, the phrase 'equalization of at least one of the elastic modulus determining stiffness and a coefficient of thermal expansion' is indefinite because the meaning of the term 'equalization' is unclear. The claim also does not establish that the insert and plastic material ever have elastic moduli which are unequal; the claim establishes that the insert and plastic material have rigidities which are unequal, but the materials may still have the same elastic moduli depending on the thicknesses of the materials. For purposes of examination, it will be assumed that the elastic moduli are equal.

The phrase 'elastic modulus determining stiffness' is indefinite, since a material has only one elastic modulus, and it is always a determining factor in thickness. For purposes of examination the phrase will be assumed to mean 'the elastic modulus.

The phrase 'gradient effect' is indefinite, because it is unclear whether or not a gradient is being claimed, and whether the coupling layer itself contains a gradient, or if it has a property which is intermediate between that of the insert and plastic, or if a gradient exists at all.

The phrase 'relative to the coefficient of thermal expansion' is indefinite because it is unclear whether a gradient in the coefficient of thermal expansion is being claimed. For purposes of examination, it will be assumed that no gradient is claimed.

The phrase 'based on the volume fraction of fibers' is indefinite because it is unclear whether the volume fraction of fibers determines the coefficient of thermal expansion. For purposes of examination, it will be assumed that the volume fraction of fibers does not determine the coefficient of thermal expansion.

The phrase 'a coefficient of thermal expansion' is indefinite, as a material only has one coefficient of thermal expansion. For purposes of examination, the phrase will be assumed to mean 'the coefficient of thermal expansion.'

The phrase 'type of fiber' is indefinite, as it is unclear what determines 'type' (chemistry, length, etc.). For purposes of examination, the fiber will be assumed to be any fiber. Correction and / or clarification is required.

6. The term "gradual" in claim 20 is a relative term which renders the claim indefinite. The term "gradual" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

7. The term "uniform" in claim 20 is a relative term which renders the claim indefinite. The term "uniform" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

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8. Claims 26, 32 and 39 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term "high" in claims 26, 32 and 39 is a relative term which renders the claim indefinite. The term "high" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Correction and / or clarification is required.

9. Claim 42 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term 'lying' is indefinite because it is unclear what fiber direction is being claimed. For purposes of examination, it will be assumed to refer to any fiber direction. The phrase 'adjacent the plastic material,' is also unclear, as all of the fibers of the coupling layer are adjacent the plastic material. The phrase 'angular deviation' is indefinite, as it does not specify the deviation which is claimed (standard deviation, etc.); the phrases and term therefore render the claim indefinite. Clarification and / or correction is required.

10. Claim 42 recites the limitation "the main forces acting on the insert" in line 9. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 102***

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. Claims 20, 29, 34 – 35 and 52 – 57<sup>65</sup> are rejected under 35 U.S.C. 102(b) as being anticipated by Reese Jr. (U.S. Patent No. 5,667,866).

With regard to Claim 20, Reese Jr discloses a plastic structural element (bonded sandwich panel; column 2, lines 5 – 21) comprising a plastic material (epoxy; column 2, lines 5 – 21) and at least one insert (honeycomb core 2, lines 5 – 21) embedded in the plastic material (the element is a sandwich); the insert is aluminum (column 3, lines 12 – 15) and therefore exhibits a different rigidity compared to the plastic; the insert is bonded, on its bottom and top, to multiple layers of fiberglass reinforced epoxy (column 2, lines 5 – 21); the innermost layers of epoxy therefore constitute coupling layers to the outermost layers.

With regard to Claim 21, as stated previously, the coupling layer is a reinforced epoxy, and therefore contains a reinforced plastic in an epoxy resin matrix.

With regard to Claim 29, as stated previously, the plastic material contains a reinforced plastic in an epoxy resin matrix.

With regard to Claims 34 – 35, as stated previously, the insert contains aluminum, which is a metal.

With regard to Claims 52 – 57, as stated previously, the insert has a honeycomb shape, and therefore has an enlarged surface area formed by openings which are hook – shaped

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elements formed by bends in the embedded length; the embedded length is therefore shaped as an anchoring element.

With regard to newly submitted Claim 65, the insert is a honeycomb, and therefore has finger – shaped projections that lie parallel.

***Claim Rejections - 35 USC § 103***

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claims 22 – 28, 30 – 33, 36 – 48 and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reese Jr. (U.S. Patent No. 5,667,866).

Reese Jr disclose a plastic structural element comprising an insert, a coupling layer and a plastic material as discussed above. With regard to Claims 23 – 27, 31 – 32, 37 – 39 and 45 – 48, Reese Jr teaches that glass fiber and carbon fiber are equivalent as reinforcement for the coupling layers and plastic material (column 2, lines 15 – 21); the claimed aspect of the fiber reinforced plastic being a mixture of carbon reinforced plastic and glass reinforced plastic, and a structural element wherein the fibers and the fiber reinforced plastic of the coupling layer are formed as fiber layers whereby a plurality of fiber layers form a fiber layer system, the individual fiber layers or the individual fiber layer systems made up of a sequence of fiber layers containing different types of fibers, and a plastic structural element wherein the fibers are carbon fibers and



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glass fibers, at least one layer of glass fibers being arranged to lie against the embedded length of the insert therefore reads on Reese Jr.

With regard to Claims 22, 28, 30, 33, 36 and 40 – 41, Reese Jr fails to disclose a structural element wherein the coupling layer contains fiber reinforced plastic with a fiber content of 30 – 70 vol%, and a fiber content of 45 – 60 vol%, and the plastic material contains a fiber reinforced plastic with a fiber content of 40 – 70 vol% and a fiber content of 55 – 65 vol%, and the coupling layer having a fiber content that is 5 – 15 vol% lower than the fiber content of the plastic material and a plastic structural element wherein the volume fraction of fibers in the coupling layer decreases toward the insert starting from the plastic material.

However, Reese et al disclose a plastic material and coupling layer having a fiber content of 100 volume % (epoxy prepeg lamina; column 2, lines 5 – 21). It would have been obvious for one of ordinary skill in the art to vary the fiber content of the coupling layer and plastic material, and the location of the fiber content (which will determine if the volume fraction of fibers in the coupling layer decreases toward the insert starting from the plastic material) since the fiber content of the coupling layer and plastic material, and the location of the fiber content would be readily determined through routine experimentation by one having ordinary skill in the art depending on the desired end result. *In re Boesch and Slaney, 205 USPQ 215 (CCPA 1980)*.

With regard to Claims 42 – 44, Reese Jr. fails to disclose a coupling layer wherein the outer and inner layers of the coupling layer are oriented within 60 degrees of each other. However, Reese Jr. discloses a coupling layer wherein the inner and outer layers of the coupling layer are oriented perpendicular (column 2, lines 22 – 38). It would have been obvious for one of ordinary skill in the art to vary the orientation of the inner and outer layers, since the orientation

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of the layers would be readily determined through routine experimentation by one having ordinary skill in the art depending on the desired end result. *In re Boesch and Slaney, 205 USPQ 215 (CCPA 1980)*.

With regard to Claim 60, Reese Jr fails to disclose an insert with end parts that are tapered at an acute angle which is the inverse tangent of 1:30 to 1:10. However, Reese Jr. discloses an insert with end parts that are tapered at an obtuse angle which is the inverse tangent of 1:30 to 1:10 (the core is a honeycomb structure; column 2, lines 5 – 21). It would have been obvious for one of ordinary skill in the art to vary the taper of the end parts, since the taper of the end parts would be readily determined through routine experimentation by one having ordinary skill in the art depending on the desired end result. *In re Boesch and Slaney, 205 USPQ 215 (CCPA 1980)*.

15. Claims 49 – 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reese Jr. (U.S. Patent No. 5,667,866) in view of Komai et al. (U.S. Patent No. 6,238,783).

Reese Jr discloses a plastic structural element comprising an insert as discussed above. Reese Jr fails to disclose an insert which has an aluminum surface which is anodically oxidized and roughened at the portions receiving the coupling layer.

Komai et al teach that it is well known in the art to anodically treat and roughen an aluminum surface prior to bonding with a thermoplastic resin layer for the purpose of obtain good adhesion (column 1, lines 28 – 65).

It therefore would have been obvious for one of ordinary skill in the art at the time Applicant's invention was made to have provided for anodically treating and roughening an

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aluminum surface prior to bonding with a thermoplastic resin layer in Reese Jr in order to obtain good adhesion as taught by Komai et al.

16. Claims 58 – 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reese Jr. (U.S. Patent No. 5,667,866) in view of Clark (U.S. Patent No. 6,004,652).

Reese Jr discloses a plastic structural element comprising an insert as discussed above. Reese Jr fails to disclose an insert which has force transferring reinforcing aramide fibers which are laminated into the plastic material so as to anchor the insert in the plastic material whereby the laminated – in reinforcing fibers are joined to the insert by a loop type connection.

Clark teaches that in the making of a structural element (structural panel; column 1, lines 10 – 21) the use of a single honeycomb layer is equivalent to the use of two honeycomb layers, which are held together by glass fibers which are woven through the two layers (therefore a loop connection) for the purpose of creating a panel which withstands high internal pressures (column 1, lines 10 – 21; column 9, lines 31 – 44).

It therefore would have been obvious for one of ordinary skill in the art at the time Applicant's invention was made to have provided for glass fibers which are woven through the two layers (therefore a loop connection) in Reese Jr in order to creating a panel which withstands high internal pressures as taught by Clark. With regard to the claimed aspect of the fibers being aramide fibers which are reinforcing, force transferring fibers, Reese Jr teaches that glass fibers and aramide fibers are equivalent as reinforcement for honeycomb structures (column 2, lines 5 – 21); the claimed aspect of the fibers being aramide (and therefore reinforcing, force transferring fibers) therefore reads on Reese Jr; with regard to the claimed aspect of the fibers being

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laminated into the plastic material so as to anchor the insert in the plastic material, Reese Jr. teaches that the lamination of the honeycomb core and the epoxy layers occurs during the curing of the epoxy (column 4, lines 1 – 27); the claimed aspect of the fibers being laminated into the plastic material so as to anchor the insert in the plastic material therefore reads on Reese Jr.

### ANSWERS TO APPLICANT'S ARGUMENTS

17. Applicant's amended claims, and Applicant's arguments, regarding the 35 U.S.C. 112, second paragraph rejections of Claims 1, 24, 26, 32, 39 and 42, and the 35 U.S.C. 102(b) rejection of Claims 20, 29, 34 – 35 and 52 – 57 as being anticipated by Reese Jr. (U.S. Patent No. 5,667,866), and the 35 U.S.C. 103(a) rejection of Claims 22 – 28, 30 – 33, 36 – 48 and 60 as being unpatentable over Reese Jr. (U.S. Patent No. 5,667,866), and the 35 U.S.C 103(a) rejection of Claims 49 – 51 as being unpatentable over Reese Jr. (U.S. Patent No. 5,667,866) in view of Komai et al. (U.S. Patent No. 6,238,783), and the 35 U.S.C. 103(a) rejection of Claims 58 – 59 as being unpatentable over Reese Jr. (U.S. Patent No. 5,667,866) in view of Clark (U.S. Patent No. 6,004,652), of record on page 2 of the previous Action, have been considered and are considered to be persuasive. The new 35 U.S.C. 112, second paragraph rejections of Claims 1, 24, 26, 32, 39 and 42, and the 35 U.S.C. 102(b) rejection of Claims 20, 29, 34 – 35, 52 – 57 and 65 as being anticipated by Reese Jr. (U.S. Patent No. 5,667,866), and the 35 U.S.C. 103(a) rejection of Claims 22 – 28, 30 – 33, 36 – 48 and 60 as being unpatentable over Reese Jr. (U.S. Patent No. 5,667,866), and the 35 U.S.C 103(a) rejection of Claims 49 – 51 as being unpatentable over Reese Jr. (U.S. Patent No. 5,667,866) in view of Komai et al. (U.S. Patent No. 6,238,783), and the 35 U.S.C. 103(a) rejection of Claims 58 – 59 as being unpatentable over

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Reese Jr. (U.S. Patent No. 5,667,866) in view of Clark (U.S. Patent No. 6,004,652) are directed to amended Claims 20 – 65.

***Conclusion***

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marc Patterson, whose telephone number is (703) 305-3537. The examiner can normally be reached on Monday through Friday from 8:30 AM to 5:00 PM. If attempts to reach the examiner by phone are unsuccessful, the examiner's supervisor, Harold Pyon, can be reached at (703) 308-4251. FAX communications should be sent to (703) 872-9310. FAXs received after 4 P.M. will not be processed until the following business day.

Marc A. Patterson, PhD.

*Marc Patterson*  
Art Unit 1772

*[Signature]*  
HAROLD PYON  
SUPERVISORY PATENT EXAMINER  
1772

*5/3/02*